Restricted Use of Success Cues in Retrieval During Posthypnotic Amnesia

Helen M. Pettinati
The Institute of Pennsylvania Hospital and
The Medical College of Pennsylvania

Frederick J. Evans
Carrier Foundation and
College of Medicine and Dentistry
of New Jersey–Rutgers Medical School

Emily Carota Orne and Martin T. Orne
The Institute of Pennsylvania Hospital and University of Pennsylvania

Memory for successful and unsuccessful responses to hypnotic suggestions was evaluated in partially amnesic subjects and in those subjects with normal forgetting. Two analyses ($N = 278$) demonstrated that highly hypnotizable subjects experiencing partial posthypnotic amnesia tended to show no selective recall for their successes or failures during amnesia, whereas the remainder of the subjects showed definite selective recall of hypnotic success posthypnotically. These findings lend support to the hypothesis put forth by Evans and Kihlstrom that posthypnotic amnesia involves a disruption of memory organization and suggests that the phenomenon may be mediated by a restriction in the use of normally employed retrieval cues.

The inability to remember material has been a source of experimental investigation since the time of Ebbinghaus (1885/1913). Forgetting is a continuous cognitive process that typically occurs outside of one's awareness, and a wide range of individual differences in the ease of forgetting can be observed. Cognitive processes can be employed to maximize (intentional) remembering. Parallel cognitive processes to ensure forgetting of overlearned material have not as yet been determined.

Several investigators have been system-

atically studying active forgetting "on cue" (Bjork, 1970; Epstein & Wilder, 1972; Reitman, Malin, Bjork, & Higman, 1973; Shebilske, Wilder, & Epstein, 1971; Weiner & Reed, 1969), where subjects are directed to forget part of the input (word list) or to remember only part of the input. Subjects typically do not report the "to-be-forgotten" material after the cue to forget has been given, even when challenged. Bjork (1970) hypothesized that two interrelated processes occur: (a) Forgetting occurs because of lack of rehearsal of the target material once the subject has been informed that it will not be necessary to remember specific material, and (b) by some cognitive process the target material is segregated from the material accessible to recall. Indeed, Epstein (1972) has argued that forgetting occurs through a highly selective memory search where "to-be-forgotten" and "to-be-remembered" material are equally available in memory, but differences in accessibility exist (see Tulving & Pearlstone, 1966, for a further clarification of this distinction). More recently, Geiselman (Note 1) has postulated a third mechanism of retrieval inhibition, whereby the cue to forget can inhibit access routes to episodic memory traces.

Although the directed forgetting paradigm differs substantially from experimentally induced posthypnotic amnesia (see Kihlstrom, Note 2, for a detailed description of the basic differences between the paradigms), the study of temporary amnesia due to hypnotic suggestion involves the ability to forget material on cue, and the theoretical constructs proposed by the investigators of directed forgetting may be useful in investigating those mechanisms involved in posthypnotic amnesia. Intentional forgetting, however, is most dramatic when forgotten memories can be subsequently recovered at will, and the reversibility of amnesia is a primary feature of the posthypnotic amnesia paradigm.

After undergoing a hypnotic session of suggestions for motor and cognitive activities, subjects are given a hypnotic suggestion to forget everything that occurred during hypnosis until the suggestion is canceled by a prearranged cue. Hypnosis is terminated and subjects are asked to recall what just occurred during hypnosis. The majority of subjects report most of what happened during hypnosis, indicating that they are not responding to the amnesia suggestion. However, a few subjects experience difficulty in remembering, as indexed by their subsequent subjective report (Evans, 1980; Hull, 1933; Kihlstrom & Evans, 1979; Orne, 1966; Spanos & Bodorik, 1977), and either report nothing or partial information.

Partial reporting is counterexpectational (total rather than partial forgetting conforms to expectational demands), and subjects with partial recall due to the amnesia suggestion show different reporting characteristics from subjects with incomplete, normal memory. Explanations of posthypnotic amnesia in terms of compliance to experimental demands have not been successful. For example, attempts to breach hypnotic amnesia by means of demands for honesty generally fail to work (Kihlstrom, Evans, Orne, & Orne, 1980; Sarbin & Coe, 1979). Moreover, unlike subjects simulating hypnosis, partially amnesic subjects may remember information learned during hypnosis but do not know where they acquired this information (Evans, 1979). In addition, material remembered during the amnesia suggestion may be disorganized (Evans & Kihlstrom, 1973; Kihlstrom & Evans, 1979; Spanos & Bodorik, 1977), compared with reports representing normal forgetting. Indeed, when Spanos, Radtke-Bodorik, and Stam (1980) asked simulators to fake partial amnesia, their meager memory reports were similar to individuals with normal forgetting: The reports were significantly more organized than reports of subjects with partial amnesia. Finally, subjects with partial amnesia will also report substantially more material when the amnesia suggestion is canceled (Kihlstrom & Evans, 1976; Nace, Orne, & Hammer, 1974; Orne, 1966). This subsequent recovery of material, termed "reversibility of amnesia," provides an index of degree of original learning, that is, that the memories had been encoded and were only temporarily forgotten. The reversibility of the amnesia legitimizes this paradigm in the study of active forgetting.

Given that the phenomenon of amnesia can be attributed to factors other than mere compliance, several investigators (Evans, 1980; Hilgard, 1977; Kihlstrom, 1977; Spanos & Bodorik, 1977) have theorized about the possible cognitive mechanisms that may be responsible for the temporary memory loss. One explanation for these findings is that retrieval is disrupted and that limited use of certain retrieval strategies occurs (Evans & Kihlstrom, 1973). This notion, based on the study of temporal sequence of memories, led to a search for other retrieval cues employed by nonamnesic subjects that may be used differently by amnesic subjects. One such cue is success, in terms of the subject's responses to the hypnotic suggestions. Although there are several alternative ways of understanding the cognitive process associated with a success event, the experience of success can easily be conceptualized as a retrieval cue. For example, when one asks an individual whether he/she was able to be hypnotized, he/she immediately begins recounting those suggestions that were easily responded to. "Pulling out" those success events can be likened to Shiffrin's (1970) construct of a search set where success events would comprise the set, and a retrieval search through memory via success cues would result in success events being re-

ported. The disruption in retrieval hypothesized to exist during posthypnotic amnesia may be better understood using Shiffrin's search set construct, whereby a restriction in search occurs during amnesic states. This restricted focus in memory search is compatible with descriptions of a narrowed focus in attention accompanying the hypnotic state itself (Krippner & Bindler, 1974).

In previous work, Pettinati and Evans (1978) found that without regard to amnesia, subjects typically remember more of their successful hypnotic experiences and fewer of their unsuccessful ones after hypnosis is completed—a finding they have found to be compatible with the results of the traditional selective recall literature where ego-involved individuals tended to remember success events better than failed ones (see Butterfield, 1964, for a review of this literature). Derived from the traditional selective recall studies by Rosenzweig (1938) that investigated repression, studies by Hilgard and Hommel (1961) and O'Connell (1966) have shown that predictions of repression based on recall of success and failure in hypnotic subjects with amnesia cannot be borne out. However, a cognitive model where success cues may be useful as retrieval aids implies a method of memory organization that has not been systematically studied.

The present study investigated the use of success cues in the verbal memory reports of partially amnesic and nonamnesic subjects following a suggestion for posthypnotic amnesia. If posthypnotic amnesia involves a restriction in the use of certain retrieval cues, it would be predicted that amnesic individuals would recall fewer success events during amnesia compared to nonamnesic individuals.

Method

Subjects

A total of 349 male and female college student volunteers were recruited for "experiments utilizing hypnosis." Hypnotic sessions were conducted in groups of varying size (up to 30 paid subjects) in the off-campus laboratory. None of the subjects had previously participated in any experiments involving hypnosis. Selective recall was evaluated for 278 subjects.[1]

Materials

A tape-recorded version of the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A; Shor & Orne, 1962)[2] was used to assess hypnotic responsiveness. The HGSHS:A lasts 50 min. and it consists of an induction of hypnosis (suggestions for head lowering and eye closure), followed by suggestions for hand lowering, arm immobilization, finger locking, arm rigidity, moving both hands together, communication inhibition, hallucination, eye catalepsy, a posthypnotic suggestion, and a suggestion for complete posthypnotic amnesia.

Procedure

Following a brief discussion of hypnosis to establish rapport, the HGSHS:A was administered. The standardized posthypnotic amnesia suggestion of the HGSHS:A accompanied by instructions for canceling or reversing the amnesia was given near the end of hypnosis:

Remain deeply relaxed and pay close attention to what I am going to tell you next. In a moment I shall begin counting backwards from 20 to 1. You will gradually wake up, but for most of the count you will still remain in the state you are now in. By the time I reach "5" you will open your eyes, but you will not be fully aroused. When I get to "1" you will be fully alert, in your normal state of wakefulness. You probably will have the impression that you have slept because you will have difficulty in remembering all the things I have told you and all the things you did or felt. In fact, you will find it to be so much of an effort to recall any of these things that you will have no wish to do so. It will be much easier simply to forget everything until I tell you that you can remember. You will remember nothing of what has happened until I say to you: "Now you can remember everything!" You will not remember *anything* until then. (Shor & Orne, 1962, p. 11)

After the termination of hypnosis and testing of the posthypnotic suggestion to touch the ankle, amnesia was tested (3 min. allowed for the amnesia recall period):

Now . . . please write down briefly in your own words a list of the things that happened since you began looking at the target. You should *not* go into much detail here

---

[1] Only 278 of the 349 subjects (81%) could be evaluated for their recall of hypnotic success and failure during amnesia: Nine subjects had total amnesia (no recall); 21 subjects recalled all of the nine relevant suggestions (no bias possible); 23 subjects either were successful at all the hypnotic suggestions or failed everything; 18 subjects failed to indicate their response to one or more of the suggestions when they completed the self-scoring response booklet of the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A).

[2] The existing scales are highly reliable, internally consistent, and valid (Hilgard, 1965; Shor & Orne, 1963).

on the particular ways in which you responded, but please try to mention all of the different things that you were asked to do. (Shor & Orne, 1962, p. 11)

After the standard amnesia recall test, a second test of amnesia was introduced into the procedure. One of three different randomly assigned instructional sets that had been designed by Kihlstrom et al. (1980)[3] to encourage full disclosure of all unreported material was used: a strong challenge to recall, a request for honesty, and retest instructions. There were 118 subjects who were instructed to try *very hard* to mention *all* of what occurred in hypnosis (challenge condition). There were 116 subjects who were told that it was *vital* that they put down *everything that they remembered* of what happened during hypnosis (honesty condition). There were 115 subjects who were given a retest with no special instructions (retest condition).

Regardless of the specific instructions given at the second test of amnesia, all subjects were allowed 3 additional min. to recall more material. After 6 min. of amnesia had elapsed (two recall tests), all 349 subjects were given the prearranged cue to.cancel the amnesia suggestion.

Reversibility of amnesia was tested using a slightly modified version of HGSHS:A (3 min. allowed for the reversibility recall period):

All right, now listen carefully to my words. *Now you can remember everything.* Please . . . write down a list of *everything* you now remember that happened since you began looking at the target. You should not go into much detail here on the particular ways in which you responded, but please try to mention all the things you were asked to do. (Modified from Shor & Orne, 1962, p. 11)

Classifying hypnotizability. All of the suggestions except for the one for posthypnotic amnesia (11 suggestions) were scored from the self-reported behaviors according to HGSHS:A standard procedures. (Self-report scoring and objective scoring by an independent judge were reported by Shor and Orne, 1963, to correlate .88.) Subjects who passed 4 or fewer of the 11 suggestions on HGSHS:A were classified as low hypnotizable subjects; subjects passing 5-7 suggestions were classified as medium hypnotizable; and subjects passing 8 or more suggestions were classified as highly hypnotizable.

Classifying posthypnotic amnesia. Posthypnotic amnesia was scored by standard procedures independently by two trained scorers. The occasional discrepancy was resolved by a third scorer. The standard criterion of passing amnesia is recalling three or fewer of the suggestions during the amnesia recall test.[4] However, there are significant problems with using this criterion for determining an amnesia experience. The subjects who are probably having the most complete amnesia experience possible recall none of the events, and so their memory reports cannot be assessed for clues clarifying the process of amnesia. Only those memory reports that include at least one suggestion (partial recall) can be evaluated for memory selectivity. Yet, recalling only one, two, or three suggestions may also be an indication of poor motivation, poor memory, or falling asleep during the session. On the other hand, there are

undoubtedly varying degrees of partial amnesia where remembering only four or five suggestions may also indicate a partial response to the amnesia experience.

A number of investigators (Kihlstrom & Evans, 1976; Nace, Orne, & Hammer, 1974; Orne, 1966; Pettinati, 1979) have suggested that it is possible to distinguish an amnesia experience due to hypnotic suggestion from mere forgetting when there is substantial recovery of memory after the cue to cancel the amnesia suggestion is given. With the reversibility criterion there is confirmation that the to-be-recalled material was initially encoded so that alternative explanations for meager recall, such as poor motivation, poor memory, or falling asleep, are no longer tenable. In the present study, amnesia was defined as present only if reversibility occurred. Based on empirical evidence (Kihlstrom & Evans, 1976), reversibility was defined as recalling at least two previously unreported hypnotic suggestions after the cue to lift the amnesia. Thus, amnesic subjects were those recalling two or more additional hypnotic suggestions after the cue to cancel amnesia was given, regardless of their initial recall during the amnesia tests.

More material might be recalled after amnesia has been canceled because of the mere passage of time (Erdelyi & Kleinbard, 1978), unrelated to the hypnotic amnesia suggestion, and some subjects will inevitably be misclassified by relying only on a reversibility criterion. Consequently, a second analysis was performed where amnesic subjects were further selected using the additional criterion of recalling three or fewer suggestions during amnesia together with the criterion of subsequent reversibility. The differences between the two analyses should be negligible, since the reversibility criterion has been heralded as a more accurate one. However, because of the uncertainty that still exists in the field in using only reversibility as the criterion of amnesia, the second analysis seemed essential.

Measuring selective recall. Selective recall during the amnesia period was evaluated by using the Recall Comparability Index (RCI). The RCI is an adaptation of traditional selective recall indices to suit the hypnotic situation in which the amount of success and failure differ from individual to individual, and the number recalled is directly manipulated by the request for amnesia. This index avoids potential bias present in previous selective recall indices (see Pettinati & Evans, 1978, for the rationale of the RCI).[5]

---

[3] Although Kihlstrom et al. (1980) also had a fourth group with instructions to recall in order, these instructions were not employed in this study because of the possible interference between the use of temporal cues and success cues.

[4] The recall of the two induction items as well as the suggestion for posthypnotic amnesia are not considered in the assessment of amnesia.

[5] The RCI is an improvement over several other indices that have been used by other investigators or could be used. The choice of an index in this setting poses difficulties because of the correlation (ranging from $-.3$ to $-.6$) typically found between number of suggestions recalled and number of suggestions passed successfully, and the desirability of comparing low hyp-

The proportion of hypnotically successful experiences remembered during posthypnotic amnesia (first component of the index) is compared to the proportion of hypnotically successful experiences not remembered, or forgotten, during posthypnotic amnesia (second component of the index). The formula is:

$$RCI = \frac{\text{No. passed recalled}}{\text{Total no. recalled}} - \frac{\text{No. passed not recalled}}{\text{Total no. not recalled}} .$$

If no selective recall for success or failure occurs, these two proportions should be equal, and each proportion should reflect the proportion of items passed out of the nine relevant HGSHS:A hypnosis suggestions. For example, if a subject passes six of the nine relevant items (or two thirds), then two thirds of the items recalled during amnesia and two thirds of the items forgotten during amnesia should be successful ones—the latter two proportions comprise the RCI. If both proportions are equal, the RCI is zero, indicating no selective bias. However, if more successful items are remembered than would be expected based on what was actually passed, then a positive numerical index results, indicating a bias for remembering successful hypnotic experiences. A negative index indicates a bias for remembering failed hypnotic experiences. The index can range from +1.00 to −1.00. An RCI was calculated for each of 278 subjects on those items that were remembered only during the amnesia tests.

Results

Sample Characteristics

The mean HGSHS:A score was 6.48 (comparable with normative data cited in Shor & Orne, 1963). The mean number recalled during amnesia (two tests) was 5.27, and the mean number reversed on the third recall test was .88. Twenty-two percent of the sample passed the reversibility criterion and were classified as amnesic.

No one type of instruction was more effective than any other in eliciting recall on the second amnesia test, and the following general characteristics of the three subgroups were similar: mean HGSHS:A, mean number recalled during the first, second, and third memory tests, the percentage of subjects who passed standardized amnesia, and the percentage of subjects who passed reversibility (for a detailed comparison, see Pet-

tinati, 1979). No significant differences were found among the three instructional sets. Thus, the groups were combined into one large sample for the assessment of selective recall. The mean RCI for the total sample was .16, a significantly positive index, $t(277) = 8.00$, $p < .0005$, indicating that in general subjects tended to remember their hypnotic successes, as opposed to their failures.

Analysis 1

Differences in selective recall between amnesic and nonamnesic subjects were analyzed using a 3×2 analysis of variance (ANOVA; method of unweighted means): The factors were hypnotizability (high, medium, low) and amnesia (pass or fail reversibility). Level of hypnotizability must be considered in any analysis of posthypnotic amnesia because of its potential influence on the extent and quality of the amnesic experience. Figure 1 illustrates the results of this analysis. Neither main effect was significant.

Although the interaction between level of hypnotizability and amnesia was not significant, $F(2, 272) = 1.14$ it can be observed from the figure that a nonlinear relationship, albeit a small one, between hypnotizability and amnesia for selective recall probably does exist, and more direct measures to determine the extent of this relationship were necessary.[6] Therefore, comparisons in selective recall of amnesic versus nonamnesic subjects were made for each level of hypnotizability so that hypnotic success was matched for each comparison. The number of available successful events and the level of motivation to comply would thus be equivalent in comparing amnesic with nonamnesic subjects. As might be anticipated from Figure 1, highly hypnotizable amnesic subjects (RCI = .03) showed a significant deficit, $t(97) = 1.89$, $p < .05$, one-tailed, in their recall of hypnotic success when compared with

notizable nonamnesic subjects (few successes) with high hypnotizable amnesic subjects (few failures). The rationale for considering several possible indices has been discussed elsewhere (Pettinati & Evans, 1978), where it was shown that conceptually, statistically, and empirically the RCI was a particularly suitable index for this application.

---

[6] Some of the subgroups include only a very few subjects, rendering the ANOVA less reliable, even when using a nonorthogonal method of analysis. Hays (1963) justifies making statistical comparisons in such a case where tests of specific comparisons may clarify the results and override the need for a more general ANOVA.
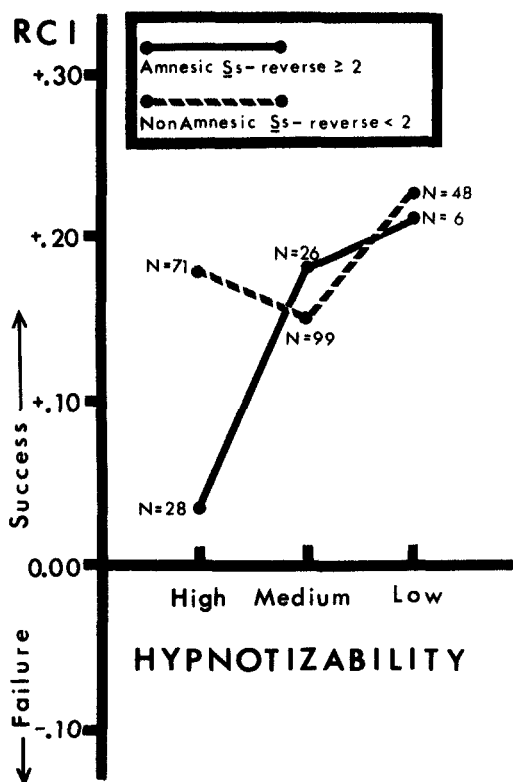
Figure 1. The mean Recall Comparability Indices (RCI) for amnesic and nonamnesic subjects with respect to level of hypnotizability.

highly hypnotizable nonamnesic subjects (RCI = .18). The RCI of .03 for the hypnotizable amnesic subjects does not differ significantly from a zero index indicating that highly hypnotizable amnesic subjects show no selective recall of either hypnotic success or failure. For the groups of subjects with lower levels of hypnotizability, RCIs were all significantly greater than zero, indicating selective recall of success events. (Medium hypnotizability: RCI for amnesic = .18 and nonamnesic = .15; low hypnotizability: RCI for amnesic = .21 and nonamnesic = .23). Thus, the subgroup of highly hypnotizable *and* amnesic subjects was the only one of the six subgroups who did not show a significant tendency to recall their successful hypnotic experiences.[7]

Analysis 2

From the group of partially amnesic subjects (those with reversibility), subjects were specially selected if they recalled only three or fewer of the hypnotic suggestions during the entire 6-min. amnesia period. This group represented a more extreme method for classifying a subject as amnesic, because two criteria had to be met (standardized amnesia and reversibility). Similarly, from the group of nonamnesic subjects (those failing reversibility), subjects were specially selected if they recalled at least four suggestions during the 6-min. amnesia period. This group represented the most extreme criteria for classifying a subject as nonamnesic, because there were two criteria to fail (no standardized deficit during the amnesia recall period and no reversibility).

Small cell sizes precluded a three-factor ANOVA in exploring the relationship among hypnotizability, number recalled, and reversibility. However, an assessment of the two groups of selected subjects who either passed two objective criteria of amnesia (8% of 278 subjects) or who failed both of the objective criteria of amnesia (72%) was possible. For this analysis, subjects were excluded if they passed one criterion of amnesia but failed the other.

Figure 2 presents the RCIs for the specially selected subgroups of amnesic and nonamnesic subjects, matching level of hypnotizability (level of success). The medium and low hypnotizable subjects were combined into one group because previous work (Pettinati & Evans, Note 3, as well as Analysis 1 above) has shown medium and low hypnotizable subjects to behave similarly in their selective recall of hypnotic success during amnesia. The interaction that is apparent in the figure was tested using a 2 × 2 (Amnesia × Hypnotizability) nonorthogonal ANOVA design and was significant, $F(1, 219) = 4.55$, $p < .05$, indicating that amnesic and nonamnesic subjects differ in their selective recall of success depending on level of hypnotic success. The highly hypnotizable amnesic subjects showed no evidence of selective recall for success or failure, and the a priori comparison between highly hypnotiz-

---

[7] Because no significant interaction was found, it was felt that a replication of these findings was desirable. These results were subsequently replicated in a sample of 569 college student volunteers (Pettinati, 1979). This time, however, the interaction between hypnotizability and amnesia was significant, $F(2, 444) = 3.03$, $p < .05$.

able subjects with amnesia (RCI = −.06) and those without amnesia (RCI = .19) yielded a significant difference in the predicted direction, $t(73) = 2.55$, $p < .01$, one-tailed. These two groups of highly hypnotizable subjects did not differ in the amount of success achieved during hypnosis.[8] The medium and low hypnotizable subjects recalled hypnotic success events to the same degree regardless of whether they were defined as amnesic ($t = .86$, ns). (Neither main effect was significant in the two-factor ANOVA.)

Discussion

These analyses provide a way to distinguish amnesia from normal forgetting by using qualitative aspects of memory reports (recall of hypnotic success) in contrast to a quantitative measurement of memory loss. Qualitative differences may represent a different cognitive processing that occurs when responding to the suggestion to forget.

The results of this experiment lend support to the hypothesis of restricted memory search during posthypnotic amnesia. The highly hypnotizable amnesic subjects, who would be the most likely candidates for having an amnesic experience, do not selectively recall their successful hypnotic experiences like the other subjects do. This finding does not represent a robust statistical effect (indeed, it should not be expected that amnesia suggestions should have profound effects in a laboratory situation). Nevertheless, based on Evans and Kihlstrom's (1973) related finding of restricted use of temporal ordering in memory reports when contrasted to those of nonamnesic subjects, our finding of reduced recall of hypnotic success by amnesic subjects, in contrast to nonamnesic subjects, suggests that success cues, too, may be restricted in memory search.

No Selective Recall in Amnesic Subjects

The reduced selective recall found only in highly hypnotizable amnesic subjects is more appropriately seen as a result of the mechanism of amnesic processes than of normal memory processing. Other explanations of the deficits are less plausible. For example, the von Restorff effect (1933), in which
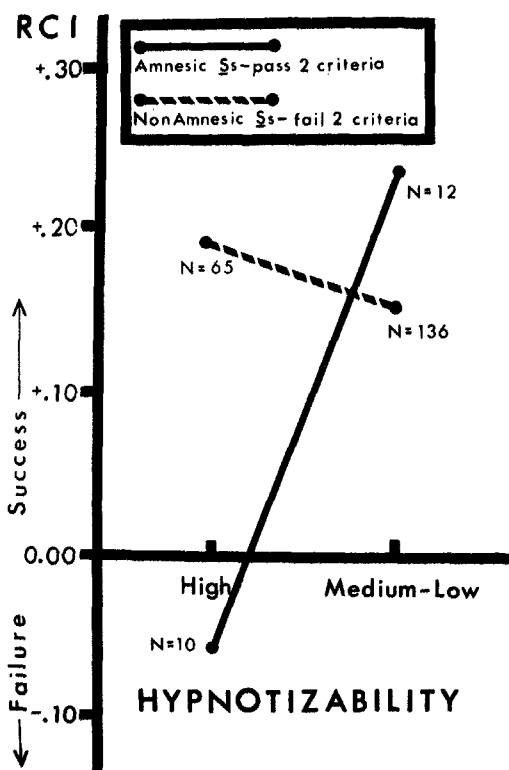

Figure 2. The mean Recall Comparability Indices (RCI) for selected amnesic subjects and selected nonamnesic subjects with respect to level of hypnotizability.

failed tasks would stand out in contrast and perhaps interfere in some way with the norm of recalling success, cannot account for the results. Although the failures of the highly hypnotizable (and the successes of the low hypnotizable) subjects might stand out, there would be no reason why, within the level of high hypnotizability, amnesic and nonamnesic subjects should differ in their reporting. The amnesia variable is important. Whereas, the nonamnesic highly hypnotizable subjects mostly recall successes, the *amnesic* highly hypnotizable subjects select neither successful nor unsuccessful events in their reduced recall. It should be noted, however, that equating quantity of success and failure (matching level of hypnotizability) cannot take into account subjective, affective

---

[8] There was no difference in the HGSHS:A scores for highly hypnotizable amnesic subjects ($M = 8.90$, $SD = .88$, $n = 10$) and for highly hypnotizable nonamnesic subjects ($M = 8.78$, $SD = .72$, $n = 65$).

experience that often accompanies success. Ongoing research is assessing subjective involvement and affect, while carrying out the suggestions rather than the objective assessment of success and failure.[9]

Subjects With Less Hypnotizability

On the other hand, it was found that merely responding to the amnesia suggestion by showing reduced recall and subsequent reversibility was not sufficient to produce the qualitative differences in memory reporting (reduced selective recall of hypnotic success). Subjects with lower hypnotizability scores who recalled less and who also showed evidence for reversibility did not report their few memories in a qualitatively different way from nonamnesic subjects. One had to be highly hypnotizable for this to be the case. The fact that highly responsive subjects were responding to the suggestion for amnesia differently from relatively unresponsive subjects may mean that unhypnotizable subjects are merely truncating their full memory report (Pettinati & Evans, Note 4). It could be that their strategy for becoming amnesic was to merely stop the normal memory process (not necessarily intentionally), in contrast to a different, more complex strategy used by truly amnesic subjects to forget.

In addition, the issue of defining amnesia is pertinent. Although the term *amnesia* means failure to recall in a generic sense, it is clear that this definition is too liberal in distinguishing an amnesia response from normal forgetting. Rather, it is our intent to define posthypnotic amnesia using criteria that will reflect that an individual is responding to the amnesia suggestion. This was done by defining amnesia in terms of its subsequent reversal. However, recovery of material, although an objective indication of the lifting of amnesia, may also be due to factors unrelated to amnesia, such as an initial verbal inhibition, behavioral compliance, fatigue, confusion, or poor motivation. It is quite possible that some subjects with lower hypnotizability may be showing increased remembering after a delay for any one of these reasons.

In summary, the evidence shows that highly hypnotizable amnesic subjects report

memories in a qualitatively different, yet predictable way. Whether these differences reflect amnesic processes, relate to normal memory processes, or have to do with the initial subjective perception of experience still remains to be seen. The potential for understanding significant loss of memory through clarifying the phenomenon of posthypnotic amnesia merits continued investigation.

---

[9] Coe, Baugher, Krimm, and Smith (1976) asked subjects to rate each suggestion (after the hypnotic session was over) on a 1–5 scale for "emotional tone." However, they had no procedure for classifying subjects as amnesic and only looked at comparisons between high, medium, and low hypnotizable subjects.

Reference Notes

1. Geiselman, R. E. Storage and retrieval mechanisms in directed forgetting. In L. M. Cooper (Chair), *Posthypnotic amnesia, directed forgetting, and memory.* Symposium presented at the 86th annual convention of the American Psychological Association, Toronto, Ontario, Canada, August 1978.
2. Kihlstrom, J. F. Instructed forgetting, hypnotic and nonhypnotic. In L. M. Cooper (Chair), *Posthypnotic amnesia, directed forgetting, and memory.* Symposium presented at the 86th annual convention of the American Psychological Association, Toronto, Ontario, Canada, August 1978.
3. Pettinati, H. M., & Evans, F. J. *Posthypnotic amnesia and the reduced selective recall of success.* Paper presented at the meeting of the Society for Clinical and Experimental Hypnosis, Asheville, N.C., October 1978.
4. Pettinati, H. M., & Evans, F. J. *Selective processing during posthypnotic amnesia.* Paper presented at the 86th annual convention of the American Psychological Association, Toronto, Ontario, Canada, August 1978.

References

Bjork, R. A. Positive forgetting: The noninterference of items intentionally forgotten. *Journal of Verbal Learning and Verbal Behavior,* 1970, *9,* 255–268.

Butterfield, E. C. The interruption of tasks: Methodological, factual, and theoretical issues. *Psychological Bulletin,* 1964, *62,* 309–322.

Coe, W. C., Baugher, R. J., Krimm, W. R., & Smith, J. A. A further examination of selective recall following hypnosis. *International Journal of Clinical and Experimental Hypnosis,* 1976, *24,* 13–21.

Ebbinghaus, H. *Memory: A contribution to experimental psychology* (H. A. Ruger & C. E. Bussenius, trans.). New York: Teachers College, Columbia University, 1913. (Originally published, 1885.)

Epstein, W. Mechanisms of directed forgetting. In G. H. Bower (Ed.), *The psychology of learning and*

motivation: Advances in research and theory. New York: Academic Press, 1972.

Epstein, W., & Wilder, L. Searching for to-be-forgotten material in a directed forgetting task. *Journal of Experimental Psychology*, 1972, *95*, 349–357.

Erdelyi, M. H., & Kleinbard, J. Has Ebbinghaus decayed with time? The growth of recall (hypermnesia) over days. *Journal of Experimental Psychology: Human Learning and Memory*, 1978, *4*, 275–289.

Evans, F. J. Contextual forgetting: Posthypnotic source amnesia. *Journal of Abnormal Psychology*, 1979, *88*, 556–563.

Evans, F. J. Posthypnotic amnesia. In G. D. Burrows & L. Dennerstein (Eds.), *Handbook of hypnosis and psychosomatic medicine*. Amsterdam, The Netherlands: Elsevier North-Holland Biomedical Press, 1980.

Evans, F. J., & Kihlstrom, J. F. Posthypnotic amnesia as disrupted retrieval. *Journal of Abnormal Psychology*, 1973, *82*, 317–323.

Hays, W. L. *Statistics for psychologists*. New York: Holt, Reinhart & Winston, 1963.

Hilgard, E. R. *Hypnotic susceptibility*. New York: Harcourt, Brace & World, 1965.

Hilgard, E. R. *Divided consciousness: Multiple controls in human thought and action*. New York: Wiley, 1977.

Hilgard, E. R., & Hommel, L. S. Selective amnesia for events within hypnosis in relation to repression. *Journal of Personality*, 1961, *29*, 205–216.

Hull, C. L. *Hypnosis and suggestibility: An experimental approach*. New York: Appleton-Century-Crofts, 1933.

Kihlstrom, J. F. Models of posthypnotic amnesia. *Annals of the New York Academy of Sciences*, 1977, *296*, 284–301.

Kihlstrom, J. F., & Evans, F. J. Recovery of memory after posthypnotic amnesia. *Journal of Abnormal Psychology*, 1976, *85*, 564–569.

Kihlstrom, J. F., & Evans, F. J. Memory retrieval processes in posthypnotic amnesia. In J. F. Kihlstrom & F. J. Evans (Eds.), *Functional disorders of memory*. Hillsdale, N.J.: Erlbaum, 1979.

Kihlstrom, J. F., Evans, F. J., Orne, E. C., & Orne, M. T. Attempting to breach posthypnotic amnesia. *Journal of Abnormal Psychology*, 1980, *89*, 603–616.

Krippner, S., & Bindler, P. R. Hypnosis and attention: A review. *American Journal of Clinical Hypnosis*, 1974, *16*, 166–177.

Nace, E. P., Orne, M. T., & Hammer, A. G. Posthypnotic amnesia as an active psychic process: The reversibility of amnesia. *Archives of General Psychiatry*, 1974, *31*, 257–260.

O'Connell, D. N. Selective recall of hypnotic susceptibility items: Evidence for repression or enhancement? *International Journal of Clinical and Experimental Hypnosis*, 1966, *14*, 150–161.

Orne, M. T. On the mechanisms of posthypnotic amnesia. *International Journal of Clinical and Experimental Hypnosis*, 1966, *14*, 121–134.

Pettinati, H. M. Selectivity in memory during posthypnotic amnesia (Doctoral dissertation, The Medical College of Pennsylvania, 1979). *Dissertation Abstracts International*, 1979, *40*, 898B–899B. (University Microfilms No. 79-15, 840)

Pettinati, H. M., & Evans, F. J. Posthypnotic amnesia: Evaluation of selective recall of successful experiences. *International Journal of Clinical and Experimental Hypnosis*, 1978, *26*, 317–329.

Reitman, W., Malin, J. T., Bjork, R. A., & Higman, B. Strategy control and directed forgetting. *Journal of Verbal Learning and Verbal Behavior*, 1973, *12*, 140–149.

Rosenzweig, S. The experimental study of repression. In H. A. Murray (Ed.), *Explorations in personality*. New York: Oxford University Press, 1938.

Sarbin, T. R., & Coe, W. C. Hypnosis and psychopathology: Replacing old myths with fresh metaphors. *Journal of Abnormal Psychology*, 1979, *88*, 506–526.

Shebilske, W., Wilder, L., & Epstein, W. Forget instructions: Effect of selective rehearsal and categorical distinctiveness. *Journal of Experimental Psychology*, 1971, *89*, 372–378.

Shiffrin, R. M. Memory search. In D. A. Norman (Ed.), *Models of human memory*. New York: Academic Press, 1970.

Shor, R. E., & Orne, E. C. *Harvard Group Scale of Hypnotic Susceptibility, Form A*. Palo Alto, Calif.: Consulting Psychologists Press, 1962.

Shor, R. E., & Orne, E. C. Norms on the Harvard Group Scale of Hypnotic Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis*, 1963, *11*, 39–47.

Spanos, N. P., & Bodorik, H. L. Suggested amnesia and disorganized recall in hypnotic and task-motivated subjects. *Journal of Abnormal Psychology*, 1977, *86*, 295–305.

Spanos, N. P., Radtke-Bodorik, H. L., & Stam, H. J. Disorganized recall during suggested amnesia: Fact not artifact. *Journal of Abnormal Psychology*, 1980, *89*, 1–19.

Tulving, E., & Pearlstone, Z. Availability versus accessibility of information in memory for words. *Journal of Verbal Learning and Verbal Behavior*, 1966, *5*, 381–391.

von Restorff, H. Uber die Wirkung von Bereichsbildungen im Spurenfeld, *Psychologische Forschung*, 1933, *18*, 299–342.

Weiner, B., & Reed, H. Effects of the instructional sets to remember and to forget on short-term retention: Studies of rehearsal control and retrieval inhibition (repression). *Journal of Experimental Psychology*, 1969, *79*, 226–232.